

REMARKSStatus of Claims

Claims 1–7, 9–17, 20, 21, 26–34, and 36 are pending in the above-identified application and stand rejected under 35 USC § 103(a).

Claim Amendments

Claims 1, 26 and 36 have been amended to describe the thin until wet material as having a fibrous component that consists of a blend of crosslinked cellulosic fibers and high surface area cellulosic fibers and to describe the temporary binding means as being polymeric (Claim 36 has been amended to describe a method to produce such materials). Support for:

- description of a fibrous component consisting of a blend of crosslinked cellulosic fibers and high surface area cellulosic fibers can be found at page 13, line 30–page 14, line 10; and
- description of polymeric temporary binding means can be found at page 18, lines 9–17.

Claims 9, 16–19, 29, 32, and 33 have been cancelled to be consistent with the amendment to Claims 1 and 26

Rejections Under 35 USC § 103

Rejection over Rhim, et al. (WO 99/32060) in view of Hollenberg, et al. (US 5,779,860) and Herron, et al. (US 5,137,537)

Claims 1–7, 10–12, 13–15, 26–28, 31 and 36 stand rejected under 35 USC § 103(a) as being obvious over WO 99/32060 (Rhim), in view of US 5,779,860 (Hollenberg, et al.) and US 5,137,537 (Herron, et al.). Specifically:

- The Office Action asserts that the Rhim reference discloses a thin until wet structure comprising a compressed web of cellulosic fibers (it may also comprise non-cellulosic fibers such as conjugate fibers) which may be bonded with a temporary binding means (polyvinyl alcohol and hydrogen bonding are cited). The Rhim structure is said to have a dry density of 0.3 g/cc and is said to expand to 80% of its uncompressed thickness. The Office Action also admits that the Rhim reference fails to disclose expanded wet density, CDH or expansion rate but asserts the Rhim structure would inherently have these properties or it would be obvious to optimize the Rhim structure to achieve these properties.

- While admitting that the Rhim structure also fails to include a wet strength binder, the Office Action adds the Hollenberg reference to the combination and asserts that it would have been obvious to add wet strength resins to enhance the resilience of the Rhim material when it is wet.
- While admitting that the combination of Rhim and Hollenberg fails to teach the use of crosslinked cellulosic fibers, the Office Action adds the Herron patent and asserts that it would have been obvious to employ crosslinked fibers in order to enhance the absorbency of the material.

The Applicants respectfully submit that the arguments presented above fail to establish a *prima facie* case of obviousness with respect to independent Claims 1, 26 and 36 as amended and claims depending from one of the independent claims. The following paragraphs discuss several of the reasons why the combination of the Rhim, Hollenberg and Herron references fails to teach a structure with a fibrous component consisting of a blend of crosslinked cellulose fibers and high surface area cellulose fibers, a wet strength means and a polymeric temporary binding means as described in Claims 1, 26 and 36 as amended.

The Applicants reiterate that, contrary to the assertions of the Office Action, providing a wet strength means involves more than simple application of the wet strength resins discussed in the Hollenberg reference to the materials described in the Rhim reference (including use of the crosslinked fibers described in the Herron reference in Rhim structures).

- 1) The Applicants respectfully submit that application of the Hollenberg resins to the Rhim structure will unpredictably change the compressed dry density and the expanded wet density of the Rhim structure due to collapse thereof. The Applicants also point out that this collapse will happen whether the fibers are resilient as described in the Hollenberg reference, crosslinked as described in the Herron reference, or the cellulosic fibers of the Rhim reference (Rhim's synthetic fibers are not considered because their use is moot given the amendment to Claims 1, 26 and 36) because it is caused by fibers moving relative to each other on wetting because no permanent inter-fiber bonds would be formed before application of the Hollenberg resins and wetting destroys existing hydrogen bonds. Specifically, the resins must be applied in a manner, such as in an aqueous solution, that allows a chemical reaction to occur between fibers to form inter-fiber crosslinks (see col. 3, lines 65-68 of the Hollenberg reference). While the Hollenberg resins can be applied at the wet end or a wet laying process or by spraying, printing, etc (col. 5, lines 40-42), in all cases this application would involve wetting the Rhim structures with an aqueous solution. As is well known, such

wetting causes cellulosic structures to collapse because, as noted above, wetting with an aqueous solution causes destruction of inter-fiber hydrogen bonds. In other words, there is no evidence that the collapsed structures would inherently, as asserted in the Office Action, have the compressed dry density and expanded wet density as described in Claims 1, 26 and 36 as amended.

- 2) The Applicants further submit that determining conditions for treating a Rhim structure so as to incorporate a wet strength resin as described in the Hollenberg reference to achieve the claimed expanded wet density would involve more than simple optimization because of the aforementioned collapse. For example, the Applicants respectfully point out that no inter-fiber bonds are formed until the Hollenberg resin cures so the Rhim structure will collapse an indeterminate amount when an aqueous solution of such resins is applied. Net, treating the Rhim material with the Hollenberg resins, as suggested in the Office Action, will result in both an indeterminate compressed dry density and an indeterminate expanded wet density because the treatment step will cause collapse of the Rhim structure. In other words, the Applicants submit that, given this collapse, determining process conditions, wet strength resin concentration, etc. in order to achieve the claimed compressed dry density and expanded wet density is not a matter of routine experimentation. The Applicants further submit that achieving the claimed properties is anything but obvious.
- 3) Treatment of the Rhim structure with the Hollenberg resins will also cause an indeterminate removal/redistribution of Rhim's moisture sensitive binders. Removal/redistribution happens because Rhim's binders are activated by water, treatment of the Rhim structure with an aqueous solution of Hollenberg's resins will activate the binder causing release thereof. Again such removal/redistribution will unpredictably affect both the collapsed dry density and the expanded wet density and achieving the claimed properties is anything but obvious.
- 4) There is nothing in the Rhim application that describes the confining pressure used to measure density. It is well known that the measured caliper, hence the measured density, of a fibrous assembly is more or less affected by the confining pressure applied during caliper measurement. Confining pressure can affect caliper by causing fibers to move relative to each other (see discussion above), by causing more or less deflection of individual fibers, etc. While the Rhim reference cites several densities, without a confining pressure, there is nothing that can be used to compare them to the currently claimed compressed dry density and expanded wet density which are measured at a confining pressure of 0.2 psi (page 46, line 2). In other words, the claimed compressed dry density and expanded wet density may, or may not, be inherent in the Rhim structure.

- 5) *Arguendo*, one could start with the wet laid structure of Hollenberg (using Herron's cross linked cellulose fibers therein) and apply Rhim's binders thereto. The Applicants respectfully submit that such application is also nonobvious. Specifically, there is nothing in any of the cited references that teaches the desirability of modifying the Hollenberg webs in such a manner (MPEP § 2143).
- The Hollenburg reference teaches calendering the wet laid webs described therein to densify them. Calendering is a well known means of stably reducing caliper in the papermaking arts. Basically, a less dense web is exposed to a high pressure causing formation of inter-fiber hydrogen bonds which hold the web in a higher density configuration after calendering. The Applicants respectfully submit that, because the Rhim reference teaches that hydrogen bonding is a suitable binder (page 13, lines 10 and 11) and because it is well known that calendering causes formation of hydrogen bonds to hold cellulose structures in a densified state, there is nothing that would lead one of ordinary skill to combine the references as suggested by the Office Action.
  - The Rhim reference is directed to solving the problem of bulky nonwoven surge materials and attempts to solve this problem by adding a water sensitive binder. The materials discussed therein are all formed by dry processes (carding, air laying, etc). As such there is no need for or mention of maintaining a wet laid web in a high density configuration. The Applicants also point out that the Rhim and Hollenberg references have the same assignee and submit that the Hollenburg reference was known, or should have been known to Rhim.
  - The Herron reference is directed to crosslinked cellulose fibers that have good wet resilience. While the fibers can be compressed for later expansion on wetting (col. 17, lines 56-68), there is nothing indicating that such compression may be unstable or the desirability of further stabilization by a polymeric binder.

Net, there is nothing in any of the cited references, or the combination thereof that would teach or suggest the desirability of modifying the Hollenberg reference to include a moisture sensitive binder.

The Applicants respectfully submit that the foregoing discussion shows that the Office Action has failed to establish a *prima facie* case of obviousness with respect to Claims 1, 26 and 36 as amended. The Applicants also respectfully point out that Claims 2-7, 10-12, 13-15, 27, 28, 31 and 36 depend from one of Claims 1 or 26, having all the limitations of the base claim. Therefore, the

Applicants respectfully request that the Examiner reconsider the rejection of Claims 1-7, 10-12, 13-15, 26-28, 31 and 36 in light of these discussions, withdraw the rejection and allow the claims.

**Rejection over Rhim, et al. (WO 99/32060) in view of  
Hollenberg, et al. (US 5,779,860) and Herron, et al. (US 5,137,537)  
and further in view of Seger, et al. (US 5,800,416)**

The Office Action rejects Claims 17, 20, 21, 29 and 30 under 35 USC § 103 (a) as being unpatentable over the combination of Rhim, Hollenberg and Heron as discussed above and further in view of Seger, et al. (US 5,800,416). The Office Action admits that Rhim fails to disclose high surface area fibers and adds the Seger patent to overcome this deficiency. The Office Action states that the Seger patent teaches incorporating high surface area fibers will enhance the absorbency of absorbent materials by providing increased capillary pressure. The Office Action concludes by asserting that it would have been obvious to add high surface area fibers to the structure of the Rhim reference in order to enhance the absorbency of the material.

Since Claims 17 and 29 have been cancelled and the rejection thereof is moot, the following discussion will be directed to Claims 20, 21, and 30. The Applicants respectfully point out that Claims 20 and 21 depend from Claim 1 and that Claim 30 depends from Claim 26. The Applicants have already shown above how the base claims are unobvious over the combination of Rhim, Hollenberg and Heron. The addition of the Seger patent does not change this situation because the new combination of Rhim, Hollenberg, Heron and Seger still fails to teach or describe structures comprising a blend of crosslinked and high surface area cellulosic fibers, a polymeric temporary binding means and a wet strength means that has a compressed dry density and an expanded wet density when the densities are measured under a confining pressure of 0.2 psi. Given that the Applicants have shown that the cited combination fails to make Claims 20, 21 and 30 obvious, they respectfully request reconsideration and withdrawal of the rejection of these claims over the combination of Rhim, Hollenberg, Heron and Seger, et al. and that Claims 20, 21 and 30 be allowed.

**Rejection over Rhim, et al. (WO 99/32060) in view of  
Hollenberg, et al. (US 5,779,860) and Herron, et al. (US 5,137,537)  
and further in view of Lippert, et al. (US 4,861,652)**

Using the combination of Rhim, Hollenberg and Heron as discussed above as the basis for the absorbent structure, the Office Action rejects Claim 34 over the combination of combination of Rhim, Hollenberg, Heron and Lippert where Lippert provides the claimed softening process.

The Applicants direct the Examiner to Claim 1 as amended and point out that they have shown above why the combination of Rhim, Hollenberg and Herron references fails to make the amended claim obvious. Claim 34 depends from Claim 1 having all the limitations of the base claim and adds a softening limitation. The addition of the Lippert Reference still fails to overcome the failure of the combination of Rhim, Hollenberg and Herron to describe the presently claimed structure that comprises a blend of fibers consisting of crosslinked cellulose fibers and high surface area cellulose fibers, wet strength means and polymeric temporary binding means where the structure has the claimed combination of a compressed dry density and an expanded wet density when the densities are measured under a confining pressure of 0.2 psi.

#### SUMMARY

All of the rejections in the Office Action have been discussed as have the distinctions between the cited references and the claimed invention. No new matter has been added by the Amendment. In light of the amendments to the claims and discussions contained herein, the Applicants respectfully request reconsideration of the rejections, their withdrawal, and allowance of all of the claims. Issuance of a Notice of Allowance at an early date is earnestly solicited.

Respectfully submitted,

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